❄ INNOVATION ABSTRACTS

Strategic Learning: The Role of Executive Control Processes

There has been a surge of interest in the acquisition and use of learning strategies in the past decade. In general, learning strategies are any thoughts or behaviors that facilitate studying and learning. Educational psychologists have learned a great deal about how to help students acquire these strategies but only now are instructional models being developed that help students to develop a systematic approach to studying and learning. A systematic approach to studying and learning gives students the ability to initiate, implement, and monitor their own learning in a strategic manner. Strategic learners are able to act as problem solvers who can custom-tailor their approach to fit with their own learning goals, the tasks' demands, the learning context, their relevant prior knowledge, and their level of expertise.

Executive Control

Executive control plays a key role in strategic learning. It involves planning how to approach a learning task or problem, selecting the strategies and methods that will be used, implementing the plan of action, monitoring its progress and success, and, if necessary, modifying the plan to more closely reach the goal.

The steps involved in executive control are not linear. Each step results from and feeds back into the other steps. Consider, for example, a student who monitors the success of using a method such as underlining key points as she reads to acquire information from a technical manual. After trying it for a while, she realizes that underlining is not the most effective method to use for information-dense text. This new awareness might lead her to reevaluate what she needs, or wants, to learn from reading the manual. She may realize that the purposes for reading a technical manual are not the same as for reading an introductory textbook. At this point, she could begin to explore other strategies that might help her.

Components of Executive Control

Planning. The planning component involves using study and learning goals as guides to determining the overall approach that will be used to achieve the learning objectives. The planning component also helps

students to determine both the personal and the supporting resources that they may need. Effective planning requires that students think about a number of variables, such as: the nature of the learning task, the level of final performance they want to achieve, their interest in performing the task, their prior experience with similar tasks, the learning and study skills that could help with this type of task, etc.

Selecting. Whereas planning helps students identify the range of potential activities and resources that they could use to reach their learning objectives, selecting is the process by which students identify specific approaches and methods that will be used. Selection decisions are constrained by the learner's goals and the learning context. Selecting often involves making trade-offs and compromises in an attempt to develop a realistic solution. How important is this assignment? How much time is available? How good am I at this subject? What is an acceptable performance level?

Implementing. Once students develop a plan that includes specific tactics for reaching the learning goals, they are ready to implement it. Critical variables for implementation include: the learner's knowledge of studying and learning techniques, the learner's experience with similar tasks, the learner's level of interest and motivation for reaching the learning goals, the learner's attitude toward the learning task, and the amount of effort that the learner is willing to expend to achieve each goal. Implementing is not simply a matter of knowing what to do; learners must also want to do it.

Monitoring. Monitoring involves checking the implementation on an ongoing, as well as a summative, basis to compare the outcomes of efforts to goals. Monitoring is the quality-control function in executive control. When students monitor their implementation on an ongoing basis, they can determine if the methods they are using appear to be helping them reach their goals for a specific learning task. By using benchmarks along the way, students can identify potential problems while still implementing their plans. Summative monitoring at the end of a learning activity helps students to determine if the appropriate overall level of

performance has been achieved.

Modifying. Sometimes it is appropriate for students to modify their approach to a learning task. Modification can occur on an ongoing basis or after a summative evaluation. Students usually become aware of the need to modify their approach when they experience some triggering event. For example, a student may have difficulty paraphrasing a section of text, or answering a review question for a test, or organizing the information in his lecture notes. Each of these events is a signal that he has a studying or learning problem. Whenever a problem is identified, modifying also involves analyzing the other components of executive control to identify the component, or components, that may need to be redefined.

Instructional Applications

Increasing Academic Awareness. One way to encourage the development of executive control is by increasing students' awareness of the factors that influence academic performance. For example, at the beginning of the semester instructors can explain their teaching philosophy, their instructional approach, and the nature of the tasks students will be expected to perform. Knowing about the instructor's expectations and understanding the nature of the academic tasks in a course helps students to create a useful study plan.

In addition, instructors can help students by asking them to be more explicit about their learning goals and increasing their awareness of how their personal characteristics as students impact their academic performance. Getting students to set specific goals for a course affects their motivation (they have something tangible for which to strive), persistence (they have an end point which marks completion), and effort (they have a measure of performance against which they can gauge their work).

Increasing Students' Understanding of Academic Tasks. Another way to foster the development of executive control is to explicitly explain the characteristics of specific academic tasks and what is required to achieve them. Increased awareness of task characteristics enables students to set more specific and measurable goals. The more information students have about the objectives of the course, as well as the criteria on which they will be evaluated, the more they will be able to regulate their learning successfully. In addition, knowledge about academic tasks is needed to help select appropriate study and learning strategies. For example, instructors can help students prepare effectively for an exam by providing information about the specific material that will be covered on the exam, the

format of the exam, the type of questions that will be asked, and how much time students will have to complete it.

Increasing Students' Understanding of How They Learn and Think. Another approach to helping students develop executive control is to focus on the variety of strategies needed to be a successful learner. However, simple knowledge of which strategies are useful is not enough. Students need to know how to implement the strategies as well as when to implement them. Therefore, instructors need to: 1) help students develop a repertoire of learning and thinking strategies; 2) instruct students in how to implement these strategies in the context of the students' personal characteristics (strengths and weaknesses) as learners, as well as the demands of the task; 3) provide opportunities for students to practice and receive feedback about their use of this knowledge; and 4) provide opportunities for students to practice and receive feedback on when it is most appropriate to apply a particular strategy. Finally, students need to be encouraged to give rationales for why they selected a particular strategy, and weigh their choices against task requirements, their individual approaches, as well as their learning and performance goals in the course.

Enhancing Students' Executive Control

Effective executive control requires awareness of academic and personal characteristics, a knowledge of what is required to successfully complete a variety of academic tasks, and a repertoire of learning and thinking strategies that can be used to accomplish our academic goals. Individual faculty members can help their students become strategic life-long learners by enhancing their knowledge and skills in each of these areas through direct instruction and modelling. In addition, the development of a strategic approach to learning and thinking requires extensive opportunities for practice and feedback in a variety of academic and applied content areas. Helping students to become strategic learners is not the responsibility of one instructor...it is one of the goals of a post-secondary education, and it is a responsibility all of us must share.

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